Technical Memorandum

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Project : Chalcot Yard, Car Lift
Date : 07/04/2015
Ref : EC13481-005
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TITLE : Car Lift Noise Survey

Environmental Equipment Corporation Limited has been commissioned by Planning Potential Ltd to undertake a noise survey of the Car Lift which has been installed at Chalcot Yard, NW1 8TZ.

Acoustic Report reference DP/EC13481-002, dated 30th June 2014 was presented to satisfy the requirements of Condition 7 of the London Borough of Camden's Final Decision Notice dated 9th May 2014, with reference to the original planning permission for the site reference 2009/0084/P. However, further to receipt of this report, Edward Davis, a Noise Officer with Camden Council, has requested via an email dated 3rd August 2014 that measurements of noise from the new plant (car lift) must be taken and a report demonstrating that the lift, as installed, meets the design specifications. This is required because the calculations within the submitted report are based on predicted noise levels in conjunction with manufactures data.

The Final Decision Notice for the planning applications stated the following in Condition 7;

> *"Prior to commencement on the relevant part of the development details of the car lift, including an acoustic report which demonstrates that the equipment will comply with the requirements of condition 7 of the original permission (2009/0084/P) shall be submitted to and approved in writing by the local planning authority."*

The original permission states;

> *"Noise levels at 1 metre external to sensitive facades shall be at least 5dB(A) less than existing background measurement (L_{A90}), or 10dB(A) less if the source contains distinct impulses (bangs, clicks, clatters, thumps)."*

The submitted acoustic report detailed the results of a background noise survey undertaken at the site and based on the requirements of Camden Council reproduces the recommended noise limits that the proposed car lift should meet at the closest noise sensitive receptor. Please note, to account for the potential impulsive noise generated by the coupling noise of the platform with the canopy of the Car Lift the 5dB penalty outlined in the original conditional planning permission has been applied to the maximum proposed noise limits, as reproduced in Table 1 below:

Period	Measured Existing $L_{A90,T}$	Proposed Noise Limit L_{Ar}
Day	40	30
Evening	35	25
Night	31	21

Table 1: Maximum Noise Limits

Further to the submittal of the initial acoustic report and assessment, the car lift has been installed incorporating the proposed noise and vibration control measures including an insulated canopy, a dense concrete shaft and acoustic louvred access doors to adjoining plant rooms.

As requested by the local authority, a noise survey has subsequently been undertaken to measure the noise emissions of the in situ car lift. The survey was undertaken between approximately 1600 hours and 1700 hours, on Tuesday 24th March 2015. Although external ambient noise level interference was minimised, background noise levels were also measured in the absence of the car lift's operation to establish any potential influence of the ambient noise level on the car lift noise measurements. A-weighted L_{eq} and L_{90} levels were recorded and weather conditions during the survey were generally calm and dry.

The equipment used for the survey was as follows:-

- 01dB Metravib Black Solo Integrating Sound Level Meter conforming to Class 1 BS EN 61672, Type 1 BS EN 60804 & BS EN 60651: 1994;
- 01dB Metravib MCE 212 Condenser Microphone, PRE 21 S Pre-amp and Connecting Leads;
- 01dB Outdoor Microphone Kit; and a
- Tripod.

The equipment holds current UKAS or equivalent accreditation and serial numbers as follows:

Sound Level Meter 01dB Black Solo	Serial No.	65736
	Calibration Date	26/06/2013
	Cal Certificate No.	CE-DTE-T-13-PVE-68348
½" MCE 212 Condenser Mic.	Serial No.	166397
	Calibration Date	26/06/2013
	Cal Certificate No.	CE-DTE-T-13-PVE-68348
Calibrator CAL 21	Serial No.	34634297
	Calibration Date	27/08/2014
	Cal. Certificate No.	01986/2

N.B. Copies of calibration certificates are available upon request.

The equipment was calibrated both before and after the survey with no difference noted in the levels.

Noise levels were measured on the lift, within the lift shaft itself, during its operation and also at the external edge of the canopy at ground floor level. A summary of the measured noise levels is shown in Table 2 below. The background noise levels were measured over a 15 minute period whilst the lift movement measurements were taken over approximately 2 minutes each; the time taken to operate the lift.

Location	Item	Measured $L_{Aeq,T}$	Measured $L_{A90,T}$
External, Ground Level	Background Noise	52 dB(A)	44 dB(A)
On Car Lift	Lift up	59 dB(A)	49 dB(A)
	Lift Down	47 dB(A)	39 dB(A)
Edge of Car Lift, Ground Level	Lift up	54 dB(A)	46 dB(A)
	Lift Down	53 dB(A)	43 dB(A)

Table 2: Measured Noise Levels

Whilst attempts were made to minimise external noise influence during the survey, there were some unavoidable noise interference from activities on site and local road traffic which affected the

measured noise levels. Consequently it is proposed that the noise levels measured within the lift shaft are utilised to best represent the noise level of the lift's operation, since these measurements best isolate the noise level of the lift.

Subjectively during the lift's operation very little noise was audible externally when the lift canopy was down (during the first half of the lifts ascent and the second half of the lifts descent). Furthermore, the noise generated from the lifts hydraulics during its decent was also considered very quiet.

Based on the noise levels measured within the lift shaft, Table 3 below predicts the propagated noise levels outside the nearest residential windows, those rear windows of the properties to the southeast of the car lift.

Item	**Measured $L_{Aeq,T}$**		**Comments**
	Lift up	**Lift Down**	
Car Lift Noise Level	59 dB(A)	47 dB(A)	SPL_{rev} within lift shaft
Correction	- 6 dB		Reverberant to diffuse field
Distance Attenuation	- 26 dB		Rathes propagation over 15m
Daytime Usage Time Correction (+ 10 log (240/3600))	- 12 dB		4 x 1 minute operation periods with canopy up, per hour
Propagated Noise Level	15 dB(A)	3 dB(A)	Outside residential windows
Cumulative Propagated Noise Level, Daytime	**15 dB $L_{Aeq,1hr}$**		

Table 3: Daytime Noise Calculation

Item	**Measured $L_{Aeq,T}$**		**Comments**
	Lift up	**Lift Down**	
Car Lift Noise Level	59 dB(A)	47 dB(A)	SPL_{rev} within lift shaft
Correction	- 6 dB		Reverberant to diffuse field
Distance Attenuation	- 26 dB		Rathes propagation over 15m
Night-time Usage Time Correction (+ 10 log (60/300))	- 7 dB		1 x 1 minute operation period with canopy up, per 5 minute period
Propagated Noise Level	20 dB(A)	8 dB(A)	Outside residential windows
Cumulative Propagated Noise Level, Night-time	**20 dB $L_{Aeq,5mins}$**		

Table 4: Night-time Noise Calculation

Position	**Period**	**Maximum Noise Limit L_{Ar}**	**Calculated Noise Level**	**Exceedance of Noise Limits**
Closest Noise Sensitive Receptor	Daytime/Evening	25 dB	15 dB $L_{Aeq,1hr}$	- 10 dB
	Night-time	21 dB	20 dB $L_{Aeq,5mins}$	-1 dB

Table 5: Car Lift Noise Level Summary

Based on the above, the measured car lift noise levels demonstrate that the installed car lift meets the design specifications stated in report ref: DP/EC13481-002, dated 30th July 2014, and therefore the requirements of Camden Council are considered to be fulfilled.